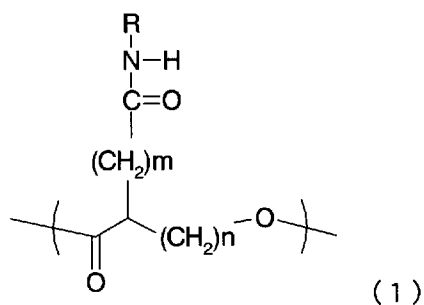


B. Claims

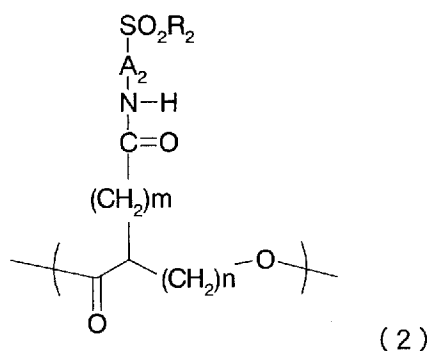
A complete listing of all the claims appears below; this listing replaces all earlier amendments and listings of the claims.

1. (Currently Amended) A polyhydroxyalkanoate comprising one or more units represented by chemical formula (1) in a molecule:

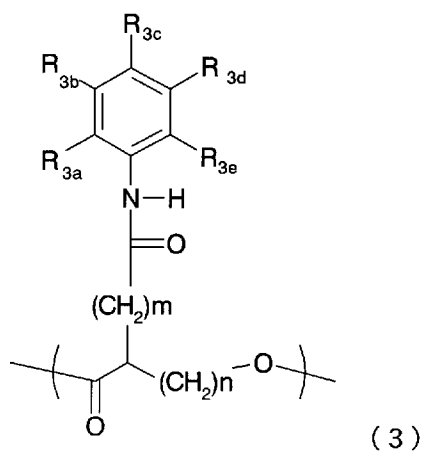


wherein R represents $-A_1-SO_2R_1$, R_1 represents OH, a halogen atom, ONa, OK, or OR_{1a} , R_{1a} and A_1 each independently represent a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, n represents an integer selected from 1 to 4, m represents an integer selected from 0-1 to 8, and when ~~multiple units exist~~ the polyhydroxyalkanoate includes more than one unit of the chemical formula (1), R, R_1 , R_{1a} , A_1 , m, and n are independently selected for each unit.

2. (Currently Amended) A polyhydroxyalkanoate according to claim 1, comprising one or more units each represented by chemical formula (2), (3), (4A), or (4B) in a molecule as units of the chemical formula (1):

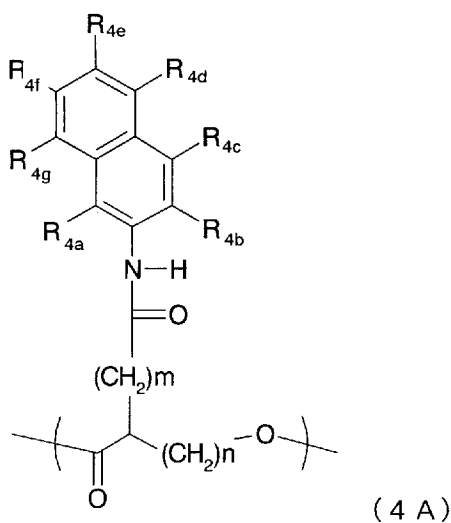


wherein R_2 represents OH, a halogen atom, ONa, OK, or OR_{2a} , R_{2a} represents a linear or branched alkyl group having 1 to 8 carbon atoms, or a substituted or unsubstituted phenyl group, A_2 represents a linear or branched alkylene group having 1 to 8 carbon atoms, n represents an integer selected from 1 to 4, m represents an integer selected from 1 to 8, and when multiple units exist the polyhydroxyalkanoate includes more than one unit of the chemical formula (2), A_2 , R_2 , R_{2a} , m , and n are independently selected for each unit,



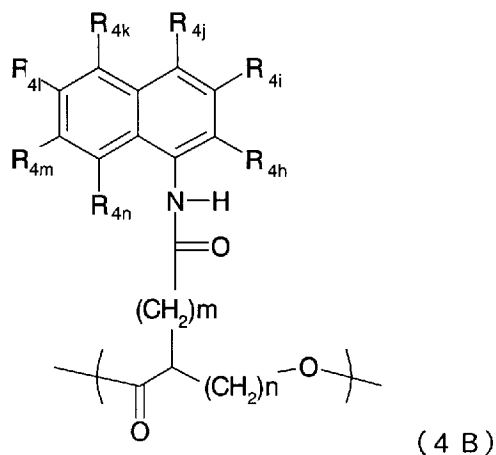
wherein R_{3a} , R_{3b} , R_{3c} , R_{3d} , and R_{3e} each independently represent SO_2R_{3f} (R_{3f} represents OH, a halogen atom, ONa, OK, or OR_{3fl} (R_{3fl} represents a linear or branched alkyl group having 1 to 8 carbon atoms, or a substituted or unsubstituted phenyl group)), a hydrogen

atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an OH group, an NH₂ group, an NO₂ group, COOR_{3g} (R_{3g} represents an H atom, an Na atom, or a K atom), an acetamide group, an OPh group, an NHPh group, a CF₃ group, a C₂F₅ group, or a C₃F₇ group (Ph represents a phenyl group), and at least one of these groups represents SO₂R_{3f}, n represents an integer selected from 1 to 4, m represents an integer selected from 0-1 to 8, and when the polyhydroxyalkanoate includes more than one unit of the chemical formula (3)~~multiple units exist~~, R_{3a}, R_{3b}, R_{3c}, R_{3d}, R_{3e}, R_{3f}, R_{3f1}, R_{3g}, m, and n are independently selected for each unit,



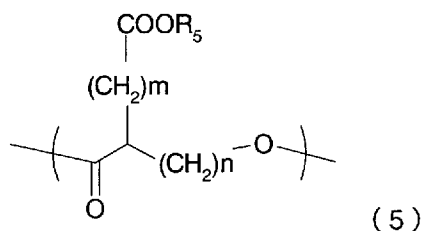
wherein R_{4a}, R_{4b}, R_{4c}, R_{4d}, R_{4e}, R_{4f}, and R_{4g} each independently represent SO₂R_{4o} (R_{4o} represents OH, a halogen atom, ONa, OK, or OR_{4o1} (R_{4o1} represents a linear or branched alkyl group having 1 to 8 carbon atoms, or a substituted or unsubstituted phenyl group)), a hydrogen atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an OH group, an NH₂ group, an NO₂ group, COOR_{4p} (R_{4p} represents an H atom, an Na atom, or a K atom), an acetamide group, an OPh group, an NHPh group, a CF₃ group, a C₂F₅ group, or a C₃F₇ group (Ph represents a phenyl group), and at least

one of these groups represents SO_2R_{4o} , n represents an integer selected from 1 to 4 and m represents an integer selected from 0-1 to 8, and when the polyhydroxyalkanoate includes more than one unit of the chemical formula (4A)~~multiple units exist~~, R_{4a} , R_{4b} , R_{4c} , R_{4d} , R_{4e} , R_{4f} , R_{4g} , R_{4o} , R_{4o1} , R_{4p} , m, and n are independently selected for each unit,



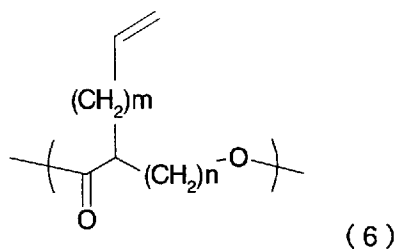
wherein R_{4h} , R_{4i} , R_{4j} , R_{4k} , R_{4l} , R_{4m} , and R_{4n} each independently represent SO_2R_{4o} (R_{4o} represents OH, a halogen atom, ONa, OK, or OR_{4o1} (R_{4o1} represents a linear or branched alkyl group having 1 to 8 carbon atoms, or a substituted or unsubstituted phenyl group)), a hydrogen atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an OH group, an NH_2 group, an NO_2 group, COOR_{4p} (R_{4p} represents an H atom, a Na atom, or a K atom), an acetamide group, an OPh group, an NHPh group, a CF_3 group, a C_2F_5 group, or a C_3F_7 group (Ph represents a phenyl group), and at least one of these groups represents SO_2R_{4o} , n represents an integer selected from 1 to 4, m represents an integer selected from 0-1 to 8, and when the polyhydroxyalkanoate includes more than one unit of the chemical formula (4B)~~multiple units exist~~, R_{4h} , R_{4i} , R_{4j} , R_{4k} , R_{4l} , R_{4m} , R_{4n} , R_{4o} , R_{4o1} , R_{4p} , m, and n are independently selected for each unit.

3. (Currently Amended) A polyhydroxyalkanoate comprising one or more units represented by chemical formula (5):



wherein R_5 represents a hydrogen atom, a group for forming a salt, or R_{5a} , R_{5a} represents a linear or branched alkyl or aralkyl group having 1 to 12 carbon atoms, or a group having a saccharide, n represents an integer selected from 1 to 4, m represents an integer selected from 0 to 8, ~~when $n = 4$, R_5 represents only a group having a saccharide for $m = 0$, and when the polyhydroxyalkanoate includes more than one unit of the chemical formula (5) multiple units exist,~~ R_5 , R_{5a} , m , and n are independently selected for each unit.

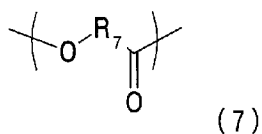
4. (Currently Amended) A polyhydroxyalkanoate comprising one or more units represented by chemical formula (6):



wherein n represents an integer selected from 1 to 4, ~~when n represents an integer~~

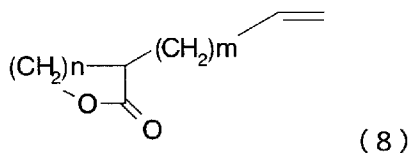
selected from 1, 2, and 4, m represents an integer selected from ~~0~~1 to 8, when n = 3, m represents an integer ~~selected from 0 and 2~~ to 8, and when the polyhydroxyalkanoate includes more than one unit of the chemical formula (6)~~multiple units exist~~, m and n are independently selected for each unit.

5. (Currently Amended) A polyhydroxyalkanoate according to any one of claims 1 to 4, further comprising a unit represented by chemical formula (7) in a molecule:

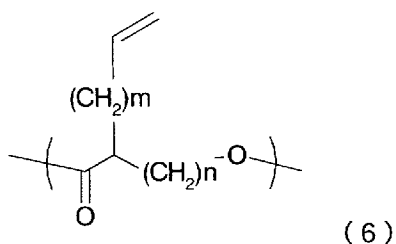


wherein R₇ represents a linear or branched alkylene group having 1 to 11 carbon atoms, an alkyleneoxyalkylene group each alkylene of which has 1 or 2 carbon atoms (alkylene groups each independently have 1 or 2 carbon atoms), or an alkylidene group having 1 to 5 carbon atoms, which may be substituted by an aryl group, and when the polyhydroxyalkanoate includes more than one unit of the chemical formula (7)~~multiple units exist~~, R₇ is independently for each unit.

6. (Currently Amended) A method of producing a polyhydroxyalkanoate represented by chemical formula (6) comprising a step of polymerizing a compound represented by chemical formula (8) in a presence of a catalyst:

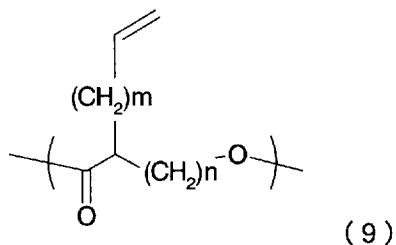


wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1, 2, and 4, m represents an integer selected from 0 to 8, and when n = 3, m represents an integer selected from 0 and 2 to 8,

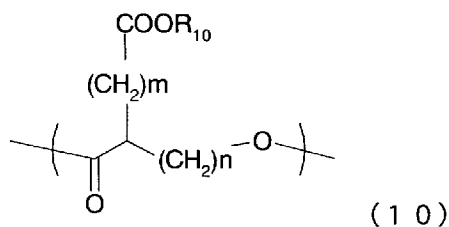


wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1, 2, and 4, m represents an integer selected from 0 to 8, when n = 3, m represents an integer selected from 0 and 2 to 8, and when the polyhydroxyalkanoate includes more than one unit of the chemical formula (6) multiple units exist, m and n are independently selected for each unit.

7. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by chemical formula (10) comprising a step of oxidizing a double bond portion of a polyhydroxyalkanoate containing a unit represented by chemical formula (9):

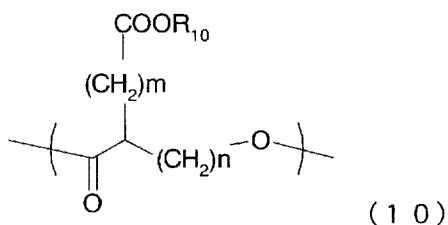


wherein n represents an integer selected from 1 to 4 and m represents an integer selected from 0-1 to 8, and when the oxidized polyhydroxyalkanoate includes more than one unit of the chemical formula (9)~~multiple units exist~~, m and n are independently selected for each unit,

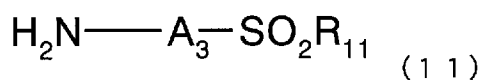


wherein R₁₀ represents a hydrogen atom or a group for forming a salt, n represents an integer selected from 1 to 4, m represents an integer selected from 0-1 to 8, and when the produced polyhydroxyalkanoate includes more than one unit of the chemical formula (10)~~multiple units exist~~, m, n, and R₁₀ are independently selected for each unit.

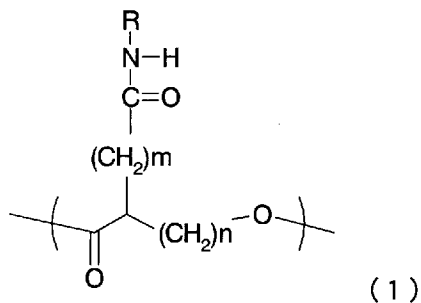
8. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by chemical formula (1) comprising a step of subjecting a polyhydroxyalkanoate containing a unit represented by chemical formula (10) and at least one amine compound represented by chemical formula (11) to a condensation reaction:



wherein R_{10} represents hydrogen or a group for forming a salt, n represents an integer selected from 1 to 4, m represents an integer selected from 1 to 8, and when the polyhydroxyalkanoate subjected to the condensation reaction includes more than one unit of the chemical formula (10), multiple units exist, m , n , and R_{10} are independently selected for each unit:



wherein R_{11} represents OH, a halogen atom, ONa, OK, or OR_{11a} , R_{11a} and A_3 are each independently selected from groups each having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, and when more than one compound of the chemical formula (11) is used in the condensation reaction, multiple units exist, R_{11} , R_{11a} , and A_3 are independently selected for each unit compound of the chemical formula (11),

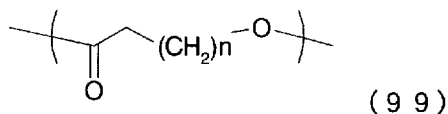


wherein R represents $-A_1-SO_2R_1$, R_1 represents OH, a halogen atom, ONa, OK, or OR_{1a} , R_{1a} and A_1 each independently represent a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, n represents an integer selected from 1 to 4, m represents an integer selected from 0-1 to 8, and when the produced polyhydroxyalkanoate includes more than one unit of the chemical formula (1)~~multiple units exist~~, R, R_1 , R_{1a} , A_1 , m, and n are independently selected for each unit.

9. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by chemical formula (101) comprising the steps of:

allowing a polyhydroxyalkanoate containing a unit represented by chemical formula (99) to react with a base; and

allowing a compound obtained in the foregoing step to react with a compound represented by chemical formula (100):

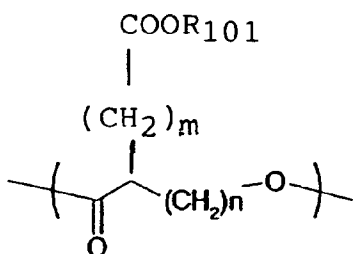


wherein n represents an integer selected from 1 to 4, and when ~~multiple units exist~~the polyhydroxyalkanoate allowed to react with the base includes more than one unit of the chemical formula (99), n is independently selected for each unit,



(1 0 0)

wherein m represents an integer selected from 0 to 8, X represents a halogen atom, and R_{100} represents a linear or branched alkyl or aralkyl group having 1 to 12 carbon atoms, and when $n = 4$ in the chemical formula (99), m is not equal to 0,

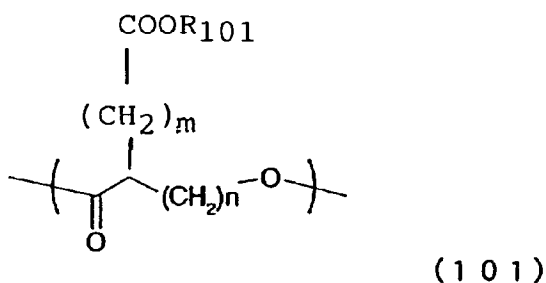


(1 0 1)

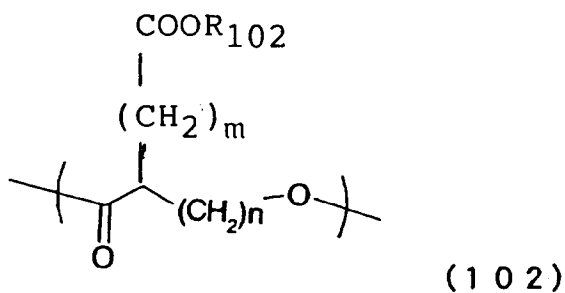
wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1 to 3, ~~m represents an integer selected from 0 to 8, when $n = 4$, m represents an integer selected from 1 to 8, R_{101} represents a linear or branched alkyl or aralkyl group having 1 to 12 carbon atoms, and when multiple units exist~~ the produced polyhydroxyalkanoate includes more than one unit of the chemical formula (101), R_{101} , m, and n are independently selected for each unit.

10. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by chemical formula (102) comprising a step of hydrolyzing a polyhydroxyalkanoate containing a unit represented by chemical formula (101) in a presence of an acid or an alkali or a step of subjecting the polyhydroxyalkanoate to hydrogenolysis including

a catalytic reduction:



wherein n represents an integer selected from 1 to 4, when n represents an integer selected from 1 to 3, ~~m represents an integer selected from 0 to 8, when n = 4,~~ m represents an integer selected from 1 to 8, R₁₀₁ represents a linear or branched alkyl or aralkyl group having 1 to 12 carbon atoms, and when ~~multiple units exist~~ the polyhydroxyalkanoate that is hydrolyzed or subjected to hydrogenolysis includes more than one unit of the chemical formula (101), R₁₀₁, m, and n are independently selected for each unit,

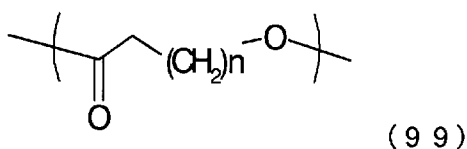


wherein R₁₀₂ represents hydrogen or a group for forming a salt, n represents an integer selected from 1 to 4. when n represents an integer selected from 1 to 3, ~~m represents an integer selected from 0 to 8, when n = 4,~~ m represents an integer selected from 1 to 8, and when ~~multiple units exist~~ the produced polyhydroxyalkanoate includes more the one unit of the chemical formula (102), R₁₀₂, m, and n are independently selected for each unit.

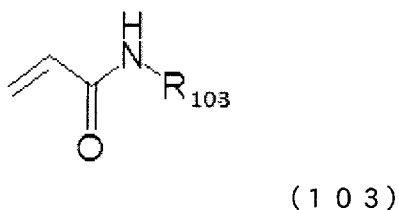
11. (Currently Amended) A method of producing a polyhydroxyalkanoate containing a unit represented by chemical formula (104) comprising the steps of:

allowing a polyhydroxyalkanoate containing a unit represented by chemical formula (99) to react with a base; and

allowing a compound obtained in the foregoing step to react with a compound represented by chemical formula (103):

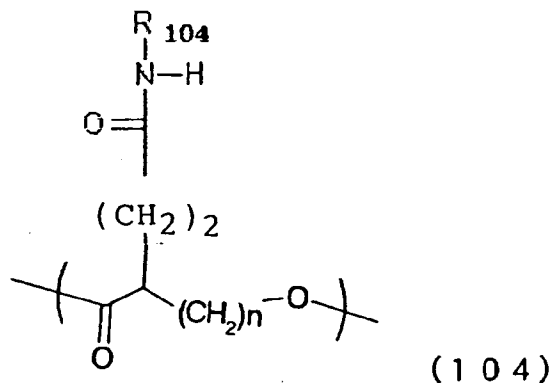


wherein n represents an integer selected from 1 to 4, and when ~~multiple units exist~~ the polyhydroxyalkanoate allowed to react with the base includes more than one unit of the chemical formula (99), n is independently selected for each unit,



wherein R₁₀₃ represents -A₁₀₃-SO₂R_{103a}, R_{103a} represents OH, a halogen atom, ONa, OK, or OR_{103b}, R_{103b} and A₁₀₃ are each independently selected from groups each having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, and when ~~multiple units exist~~ more than one compound of the chemical formula (103) is allowed to react,

R_{103} , R_{103a} , R_{103b} , and A_{103} are independently selected for each compound of the chemical formula (103) unit,



wherein n represents an integer selected from 1 to 4, R_{104} represents $-A_{104}-SO_2R_{104a}$, R_{104a} represents OH, a halogen atom, ONa, OK, or OR_{104b} , R_{104b} and A_{104} each independently represent a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure, or a substituted or unsubstituted heterocyclic structure, and when ~~multiple units exist~~ the produced polyhydroxyalkanoate includes more than one unit of the chemical formula (104), R_{104} , R_{104a} , R_{104b} , A_{104} , and n are independently selected for each unit.